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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/251,183	02/17/99	LIN	MSLIN98-002C

GEORGE O SAILE  
20 MCINTOSH DRIVE  
POUGHKEEPSIE NY 12603

MM42/1020

EXAMINER

GARCIA, J

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 10/20/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/251,183

Applicant(s)  
Lin

Examiner  
Joannie Adelle Garcia

Group Art Unit  
2823



☐ Responsive to communication(s) filed on \_\_\_\_\_

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-79 is/are pending in the application.

Of the above, claim(s) 29-48 is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-28 and 49-79 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on 2/17/99 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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The disclosure is objected to because of the following informalities: On page 4, line 13, "is" after "present invention" or before "the primary objective" should be deleted. On page 12, lines 11 and 14, and on page 16, line 10, "metalization" should be replaced by --metallization--. On page 19, line 10, "by" should be replaced --be--. On page 23, line 5, "130" should be replaced by --131--. On page 23, line 6, "131" should be replaced by --130--. On page 23, line 12, "for", second occurrence, should be replaced by --of--. On page 23, line 3, "121" should be replaced by --120--.

Appropriate correction is required.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 36 on page 16, line 3.

Correction is required.

The drawings are objected to because "23?", in figure 7 should be replaced by --23--.

Correction is required.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "120" has been used to designate both 120 and 131. Correction is required.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 122 and 125 on page 23, line 7. Correction is required.

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Claims 3-9, and 50-55, are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claims merely labels the top metallization system, and the overlaying interconnecting metallization structure, and therefore, do not further limits the processes of claims 1 and 49, respectively.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-28, and 49-79, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, lines 1, 5, 9, 14, 16, 17, and 18, claim 2, lines 1-3, claim 3, lines 1 and 3, claim 4, lines 1 and 3, claim 5, lines 1 and 4, claim 6, lines 1 and 4, claim 7, lines 1 and 4, claim 8, lines 1 and 4, claim 9, line 2, claim 25, line 1, claim 27, line 1, claim 28, line 2, claim 49, lines 1, 5, 9, 12-14, claim 50, lines 1 and 3, claim 51, lines 1 and 3, claim 52, lines 1 and 3, claim 53, lines 1 and 4, claim 54, lines 1 and 4, claim 55, lines 1 and 4, claim 56, line 2, claim 57, line 4, claim 63, lines 1, 5, 7, 12, 15, 17, 18-20, 23, and 24, claim 64, lines 1 and 3, claim 65, lines 1 and 3, claim 66, lines 1 and 3, claim 77, lines 2-4, 6, 11, and 13, claim 78, lines 2-4, 6, 11, and 13, and claim

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79, lines 2-4, 6, 11, and 13, "metalization" should be replaced by --metallization--.

In claim 23, line 2, "comprise" should be replaced by --comprising--.

In claim 14, lines 2-3, it is unclear what is recited by the use of "any other appropriate insulating material".

In claim 25, lines 3-5, claim 26, 3-6, claim 27, lines 5-7, and claim 28, lines 5-8, it is unclear what is recited by the use of "any appropriate contact material, such as but not limited to tungsten, chromium, copper (electroplated or electroless), aluminum, polysilicon, or the like".

The following is a quotation of 35 U.S.C. Claims are rejected under 35 U.S.C. 103(a) as being unpatentable over(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-28, and 49-79 are rejected under 35 U.S.C. as being unpatentable over Bandyopadhyay et al, in combination with Yamada'778, Yamada'020, Wolf and Cronin.

Bandyopadhyay et al discloses forming an integrated circuit comprising a plurality of devices formed in and on a semiconductor substrate (Column 1, lines 22-23), with an overlaying interconnecting metallization structure 12 connected to said devices and comprising a plurality of first metal lines in one or more layers, depositing a passivation layer 22 over said interconnecting metallization structure 12, depositing an insulating, separating layer 24 over said passivation layer

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22 that is substantially thicker than said passivation layer 22 (Figure 2), forming openings 38 through said insulating, separating layer 24 and said passivation layer 22 to expose upper metal portions of said overlaying interconnecting metallization structure 12 (Figure 9), depositing aluminum, tungsten, or copper as metal contacts 40 in said openings 38 (Figure 10), and forming a top metallization system 42 connected to said overlaying interconnecting metallization structure 12 (Figure 12), wherein said top metallization system 42 comprises a plurality of top metal lines, in one or more layers, and said top metallization system 42 connects portions of said interconnecting metallization structure 12 to other portions of said interconnecting metallization structure 12 (Column 6, lines 53-57, and Figure 12). He is also disclosing a metallization system containing signal lines, power busses, and ground busses (Column 1, lines 23-33), and forming contact pads 14 on the top metal layer of the top metallization system 42 (Column 5, lines 7-8, Column 6, lines 57-58, and Figures 1 and 13). He is also disclosing could be made of Al, W, or polysilicon (Column 1, lines 47-49). He is not disclosing that the top metal lines are wider than the first metal lines, and that the interconnecting metallization structure 12 is in the range of approximately 0.3  $\mu\text{m}$  to 5.0  $\mu\text{m}$ . He is not disclosing either that the passivation layer 22 comprises a layer within the range of approximately 0.15 to 2.0  $\mu\text{m}$  Plasma Enhanced CVD (PECVD) oxide over which a layer within the range of approximately 0.5 to 2.0  $\mu\text{m}$  Plasma Enhanced CVD nitride is deposited. He does not teach either that the insulating, separating layer 24 is polyimide, and that the insulating, separating layer is in the range of approximately 1.0 to 30  $\mu\text{m}$ . He is not disclosing either forming the metal contacts by damascene metal filling, and spin-on

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coating and curing the insulating, separating layer.

Yamada'778 discloses forming top metal lines 89 which are wider than first metal lines 83 (Column 3, lines 34-35, and lines 64-65, and Figure 4D), and that such first metal lines 83 are in the range 0.5 um to 1.0 um (Column 3, lines 46-47). He also discloses forming an oxide insulating, separating layer 15 with a thickness of 1.0 um (Column 8, lines 21-23, and Figures 7a-7b).

Yamada'020 teaches forming an oxide passivation layer 15 as large as a thickness of approximately 2.0 um (Column 6, lines 65-66, Column 7, lines 4-5, and Figure 3a) over which a layer within the range of approximately 0.2 to 0.5 um Plasma Enhanced CVD (PECVD) nitride is deposited (Column 6, lines 65-66, Column 7, lines 10-12, and Figure 3a).

Wolf discloses the use of polyimide as intermetal dielectrics (Pages 214-216, Page 217, lines 1-11, and Page 235, lines 24-36). He is also teaching spin-on-glass for an insulating, separating layer (Pages 229-233).

Cronin teaches forming metal contacts by damascene metal filling (Column 2, lines 18-26).

The examiner takes judicial notice that the specific recited spin-on coating and curing steps were known at the time of applicant's invention. It would have been within the scope of one of ordinary skill in the art to employ the processes of Yamada'778, Yamada'020, Wolf and Cronin, and the known steps for their disclosed intended purpose to achieve the process of Bandyopadhyay et al.

With regard to claim 28, the choice of layout for the signal pads, power and ground

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connection pads would be a matter of design choice within the teachings of Bandyopadhyay.


Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. See **MPEP 203.08**.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner J. Garcia whose telephone number is (703) 306-5733. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax number for this group is (703)308-7722(and 7724 and 7382). MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.

  
JAG

October 12, 1999

  
George Fourson  
Primary Examiner  
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